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DIVISION OF MYCOLOGY AND DISEASE SURVEY

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IN THIS ISSUE

Because of the wide distribution and obscure nature of the yellows or leaf variegation of the Blakemore strawberry, Paul H. Millar's report that some plantings in Arkansas have been found to be free from the trouble is of special interest, page 70.

Geo. M. Darrow and F. B. Morrow report severe damage caused by leaf scorch to strawberry plantings in North Carolina last fall, page 71.

The results of counts for corn ear rots in plots at the University of Illinois are reported by Benjamin Koehler, page 72.

Manson B. Linn contributes a list of diseases of economic plants observed on Staten Island during the past four years, page 73.

Observations on plant diseases in southern California in 1936 are reported by H. G. MacMillan and O. A. Plunkett, page 76.

Rhizoctonia solani is the fungus most frequently isolated from diseased deciduous seedlings in Midwest nurseries, according to Ernest Wright, page 80. Some of the hosts listed seem to be new. Pythium sp. is also common. In a brief appended paragraph, Bowen S. Crandall gives some additional information on Rhizoctonia, page 82.

Temperature in 1936, page 83.

FREEDOM FROM "YELLOWS" OF CERTAIN PLANTINGS OF THE BLAKEMORE STRAWBERRY

Paul H. Millar

Since "Blakemore Yellows" (leaf variegation) was first reported in 1933 (Plant Disease Reporter 17:145) this trouble or defect has been found to be prevalent in all parts of the United States. In view of the undesirability of strawberry plants showing this trouble, the inspectors of the Arkansas State Plant Board have kept careful records of those plantings which were free or nearly free, with the hope that a line of yellows-free stock might thus be discovered.

In July, 1935, inspectors of the Plant Board found a two-acre field of Blakemores in White County, Arkansas, which was entirely free of yellow plants. This field, which belonged to Mr. Frank Gray, had been set in the spring of 1935 from plants taken from a one-acre field, also belonging to Mr. Gray. The one-acre field on examination also proved to be free of yellow plants. It was found that the one-acre field had been set in 1932 from a field belonging to Mr. Henry McLaughlin. When this field was examined it was also found to be entirely free of yellow plants. Mr. McLaughlin's Blakemores were the progeny of 50 plants, a part of a shipment received from the East about 1929.

Mr. McLaughlin said that in addition to the plants which he had given to Mr. Gray in 1932, Mr. Carl Byard, Mr. Paul McAdams, Mr. Jack Porter, and Mr. E. T. McAdams, had also secured plants from him (in 1934), and that these were the only plants which had been taken from his fields. On examination, Mr. Byard's field (1/2 acre), Mr. Porter's field (1/2 acre), and Mr. E. T. McAdams' field (1-1/4 acre) were also found to be entirely free of yellow plants. The field set by Mr. Paul McAdams had become infested with insects and had been plowed up. Thus, all the known progeny of the 50 plants that Mr. McLaughlin had obtained about six years previously were entirely free of yellow plants in July, 1935.

Further search revealed a one-half-acre yellows-free field belonging to Mr. Luther Cleveland, which did not originate from the McLaughlin field. This made five Blakemore fields, all in White County, Arkansas, out of a total of 75 inspected in the State in July, 1935, in which no yellow plants were found.

However, when these five fields were again inspected in November, two or three yellow or yellow-tinged plants were found in three of them. These were removed by the inspectors.

In the spring of 1936 all the plants in all five fields were dug and sold to neighboring farmers, except the one-acre Gray field and four

or five rows in the two-acre Gray field, which were kept for fruiting, and the McAdams field, the plants from which were dug and shipped. Sixty fields on as many different farms were set with these plants, comprising a total of about 70 acres. Of these 60 fields, 45 were set with plants taken from the two-acre Gray field. Most of the fields were within a three-mile radius. Each of the fields was inspected three times in 1936. The results were as follows:

June inspection - 28 of the 60 fields showed yellow plants.

August inspection - 32 of the 60 fields showed yellow plants.

October inspection - 46 of the 60 fields showed yellow plants.

As will be noted, 14 of the 60 fields came thru the summer of 1936 without producing any yellow plants. The percentages of yellow plants in October in the remaining 46 fields were as follows:

Less than 1 percent of the plants yellow - 43 fields.

Between 1 percent and 2 percent of the plants yellow - 3 fields.

By October there were many yellow plants showing up in the four or five rows which had been left for fruiting in the two-acre Gray field. Not a single yellow plant, however was to be found in the original one-acre Gray field, which was the parent field of the two-acre Gray field. In other words, there are not now and never have been, so far as we know, any yellow plants in the parent field, yet some of the progeny when planted in fields in the same locality and even on the same farm, are showing yellow.

All field inspections were made by L. U. Wiles, Inspector for the Arkansas Plant Board. (Arkansas State Plant Board).

LATE FALL DAMAGE TO STRAWBERRIES BY LEAF SCORCH

Geo. M. Darrow and E. B. Morrow

On November 20, 1936, several fields of Klondike strawberries were visited in the Chadbourn-Whiteville-Tabor area in North Carolina. These showed extremely severe injury from leaf scorch, Diplocarpon earliana (Ell. and Ev.) Wolf (Mollisia earliana (Ell. and Ev.) Sacc.). Counts were made of living and dead leaves in the field showing severest injury. In the best part of the field, 20 plants had 198 dead (75 percent) and 67 living (25 percent) leaves, and in the worst-affected part 8 plants had

83 dead (83 percent) and 17 living (17 percent) leaves. The living leaves, however, were very small young leaves and the dead leaves much larger ones. Actual measurements of the living leaves averaged 1.75 square inches each, and of the dead 8.0 square inches, while those on plants still quite free from scorch averaged 11.0 square inches. In the best parts of the field, therefore, 93 percent of the leaf area was dead and 7 percent alive, and in the worst 96 percent dead and 4 percent alive. In all the other fields visited, spots could be found where leaf scorch had killed as much as 93 percent of the leaf area, while some plants were entirely dead. Leaf scorch was still spreading, for young leaves not fully grown were found infected, certainly since November 1.

Though more than nine-tenths of the leaf area had been destroyed, these plants still had large root systems and might make a small crop, provided all new foliage is protected. Extensive crown and root development still could occur under favorable conditions. Though yield in the spring is closely correlated with leaf area in November, the large root systems of these plants give them a great potential advantage. (Division of Fruit and Vegetable Crops and Diseases, and North Carolina Agricultural Experiment Station).

CORN EAR ROTS IN PLOTS AT THE UNIVERSITY OF ILLINOIS, 1936

Benjamin Koehler

Percentages were determined by weight. Only ears with ten or more rotted kernels were considered rotted. Thus the "rotted" ears contain considerable sound corn, but on the other hand I have found that the group classified as sound from surface appearances, when shelled contained a significant amount of rotted kernels. About 300 bushels were sorted.

Diplodia zeae	0.37 percent
Fusarium moniliforme. .	7.50 percent
Gibberella saubinetii .	Trace
Nigrospora sphaerica (*Basisporium gallarum*)	0.20 percent

(Illinois Agricultural Experiment Station).

A LIST OF DISEASES FOUND ON ECONOMIC PLANTS ON STATEN ISLAND (RICHMOND COUNTY), NEW YORK FROM 1932 TO 1936

Manson B. Linn

The following is a compilation of plant diseases encountered from time to time over a four-year period. It is not the result of any specific or extensive survey and for that reason many diseases of considerable interest may have been overlooked. However, those diseases most commonly found in this particular agricultural section of Greater New York City are included.

Diseases Caused By Fungi

Botrytis sp., blight. On lily. Disfiguring of leaves often severe.

B. cinerea, gray-mold rot. On lettuce. General; uncontrolled.

Leaf mold. On geranium. Of little economic importance.

B. paeoniae, blight. On peony. Fairly severe at times.

B. tulipae, fire blight. On tulip. Of little economic importance.

Ceratostomella ulmi, Dutch elm disease. On American elm, general.

Cercospora apii, early blight. On celery and celeriac. General; severe under some conditions.

C. beticola, leaf spot. On beet. General; causes very little loss.

Corticium vagum. Damping-off of vegetable and flower seedlings. General; causes severe losses at times.

Bottom rot. On lettuce and escarole. Losses are heavy in some seasons.

Wirestem. On cabbage, cauliflower. Severe in some seasons.

Cylindrosporium chrysanthemi, leaf spot. On chrysanthemum. General; sometimes causes severe damage.

Endophyllum sempervivi, rust. On Sempervivum tectorum. Frequently severe; localized.

Erysiphe cichoracearum, powdery mildew. On Phlox sp. Causes severe damage at times.

On squash and cucumber. Seldom severe.

Fusarium sp., yellows. On celery. Found twice in four years.

Corm rot and wilt. On freesia. Localized; often damage is severe.

F. bulbigenum lycopersici, wilt. On tomato. Localized.

F. conglutinons, yellows. On cabbage. Localized; severe in some years.

F. conglutinans callistephi, wilt. On China aster. Localized; decreasing in importance.

Macrosporium carotae, blight. On carrot. General; severe in some seasons.

Mycosphaerella citrullina, fruit spot. On pumpkin. Infrequently found.

Peronospora spinaciae, downy mildew (blue mold). On spinach. Found but twice in four years.

Phoma terrestris, pink root. On onion. General; of little economic importance.

Phomopsis vexans, blight. On eggplant. Infrequently found.

Phyllosticta straminella, leaf spot. On rhubarb. General; of little economic importance.

Phytophthora infestans, late blight. On tomato fruit. Rarely severe.

P. richardiae, root rot. On calla lily. Rarely found.

Plasmodiophora brassicae, club root. On cabbage, rape. Of no economic importance.

Puccinia malvacearum, rust. On hollyhock. Enphytotic.

Pythium spp. Damping-off of vegetable and flower seedlings. General; causes severe losses at times.

Sclerotinia sclerotiorum, drop. On lettuce. General; losses dimishing.

Septoria apii, late blight. On celery. General; severe under some conditions.

S. lycopersici, leaf spot. On tomato. General; of little economic importance.

Ustilago zeae, smut. On sweet corn. General; losses are fairly severe.

Verticillium albo-atrum, wilt. On eggplant. General; of little economic importance.

Bacterial Diseases

Aplanobacter michiganense, canker. On tomato. Found only once causing little damage.

A. stewarti, wilt, Stewart's disease. On sweet corn. Infrequently found.

Bacillus amylovorus, blight. On pear. Infrequently found.

B. carotovorus, soft rot. On calla lily. Rarely found.

Bacterium apii. Bacterial leaf spot or blight. On celery. Of no economic importance.

B. campestre, black rot. On cabbage. General; severe in some seasons.

B. hederae, leaf spot. On English ivy. Localized; frequently found.

Virus Diseases

Breaking. On tulip. General; losses are usually small.

Mosaic. On lettuce. General; less than 8 percent in spring.

On tomato. General; enphytotic.

On pepper. General; enphytotic.

On petunia. General; enphytotic.

On lily. Localized; enphytotic.

On raspberry. Localized; enphytotic.

Mosaic, stunt. On dahlia. Moderately severe.

Yellows (aster yellows virus). On escarole. General; enphytotic.

On China aster. Generally controlled.

On lettuce. Rather severe losses.

On chrysanthemum. Infrequently found.

On salsify. General; less than 2 percent loss on average.

On carrot. General; increasingly severe.

Yellows (mosaic). On spinach. General; severe from midsummer on.

Non-parasitic Diseases

Blossom-end rot. On tomato fruit. General; seasonal.

Oedema. On cabbage. Infrequently seen.

Tip burn. On lettuce, escarole. General; seasonal.

Whiptail. On cauliflower. Infrequently seen.
(New York (Cornell) Agricultural Experiment Station).

PLANT DISEASES OBSERVED IN SOUTHERN CALIFORNIA IN 1936

H. G. MacMillan and O. A. Plunkett

ALFALFA. Rust, Uromyces striatus: Common and general on alfalfa in the fog belt of Los Angeles County, October 14.

Oxnard, Ventura County, general along coastal fog belt.

Leafspot, Pseudopeziza medicaginis: General throughout the coastal region of Southern California, October 22.

CAPSICUM SP. Redpepper, C. annuum. Over fields amounting to several hundred acres, 50 percent of the plants are attacked by Fusarium wilt. The effects range from complete killing to wilting of plants and premature drying of pods. Los Angeles County, September 16.

Downey, Los Angeles County, October 14. Fusarium sp. is causing the death of 10 percent of the plants in two large fields. Alternaria sp. causes pod rot of 40 to 50 percent of the pods. The dead plants and pods are generally host to an abundant growth of Cladosporium.

On pimiento, pod rot caused by Alternaria sp. is common and extensive, causing 25 percent or more loss. Oxnard, Ventura County, October 22.

CARROT. Leaf blight, Cercospora carotae: Oxnard, Ventura County, May 22. The leaves become infected, developing brown lesions or extensive yellowing, and dying later. Lesions on the petioles are common. Condition of the roots is perfect but the condition of the tops determines salability, and this general infection is the cause of a very considerable loss. This area is within the fog belt.

Santa Paula, Ventura County, May 26. In some fields the tops had been mowed to remove diseased leaves. The remnants of old petioles are badly diseased with Cercospora but new growth is clean. Cool weather and fog had been prevalent during the past several days.

Lompoc, Santa Barbara County, May 28. Carrots being grown for seed were in full flower. The lower leaves and petioles were generally infected with Cercospora.

Santa Maria, Santa Barbara County, May 28. Cercospora is abundant on the western side of the Santa Maria Valley, causing the abandonment of some fields.

Scab, Actinomyces scabies: Occurring in scattered spots over fields near Santa Maria. The roots are pitted and corroded. May 27.

Leaf blight, Macrosporium carotae: Causing indeterminate loss near Guadalupe, Santa Barbara County, May 27. Traces of Macrosporium in fields near Oxnard, October 22.

CELERIAC. Foot-rot, Sclerotinia sclerotiorum: A few plants in one field found rotted at the surface of the ground. Los Angeles County, October 14.

CELERY. Montalvo, Ventura County, May 22. A field of celery planted February 10 and maintained under good conditions was failing rapidly from black heart. Fifty percent of the plants were worthless, and most of the others showed signs of breaking down. Celery appears to become liable to black heart from 95 days after planting. This field, 102 days from planting showed a rapid increase of worthless plants from morning to afternoon of the same day. Pitted brown stem was common throughout the field. No mosaic was found in this section. Celery as a truck crop has been only recently introduced. Septoria apii was lightly but very generally distributed on the lower and shaded leaves, and causing no appreciable loss.

Venice, Los Angeles County, May 25. In fields approaching harvest mosaic is general and severe. Some fields are completely infected. In others there are spots in general dimensions four by ten feet in which all plants are severely infected. Plants at the ends of the rows are usually diseased. The non-blanching type of celery is slightly less affected than the blanching type. Insects of several genera are abundant.

San Diego County, June 9. Celery escaped from cultivation is found commonly in the marshy places in valley bottoms, and in desert surroundings where seepage supplies constant water. Septoria apii is commonly found on the leaves of celery in these places, but in no instance was it found to be severe. On all the wild or escaped celery observed, no case of mosaic has been seen.

Venice, Los Angeles County, June 18. Black heart varies from field to field, from 5 percent to as much as 15 percent in the older plants. Mosaic also varied widely from field to field, some having as much as 50 percent severely affected plants. Very little Cercospora apii found at this time. Septoria apii was common, but not causing damage.

June 19. Celery growing wild in the Los Angeles River bottoms shows only minor infections with Septoria. The plants remain free from Cercospora and mosaic.

Chula Vista, San Diego County, June 26. Black heart. Fields abandoned, 100 percent loss. This is the end of the season.

Venice, Los Angeles County, August 13. Cercospora apii is very common in all fields, doing considerable damage. The stalks are frequently affected, spotted. In a few fields the disease is so bad the crop will be unmarketable. Fields of carrots interspersed among the celery fields show no trace of Cercospora, or in fact, any blemish on a most luxuriant foliage. Mosaic is common in the field. In flats at greenhouses, to which seedling celery plants have been transferred, there are abundant symptoms of what appears to be mosaic. Sclerotinia sclerotiorum was found in several fields scattered in distribution, but causing a complete loss of the diseased plants.

Venice, September 1. Fusarium sp. A single field in this section developed a severe case of Fusarium root rot. The field had been in celery continuously for an unknown number of crops. The disease began to appear in evidence when the few unaffected plants were eight to ten inches high. The majority were diseased, and remained stunted at about four inches high. In many the roots were completely rotted away. The field was abandoned so far as further culture was concerned when a change to a lower temperature continuously for several days occurred. In a month or so the celery had recovered, new roots and tops developed, and part of the field was later harvested.

San Diego County, September 2. Septoria apii. Spots found scatteringly on leaves of escaped celery in seepage area in dry surroundings beyond Warners Springs.

Los Angeles County, September 16. Cercospora continues to develop generally on cultivated celery. Carrots growing in adjacent fields are free from Cercospora. Mosaic. Plants about six inches high show 80 percent infection with mosaic throughout several fields near Redondo.

CHOKECHERRY. Prunus demissa (Nutt.) Dietr. The western chokecherry: Black knot, Dibotryon morbosum. On top of Mt. Palomar at about 6,000 feet there is a large thicket of western chokecherry. The plants are severely affected by the fungus, which causes large and extensive cankers, killing stems and branches, and sometimes the whole plant.

CORN. This crop is not grown extensively in Southern California. Near Oxnard, Ventura County, on October 22, 1936, in a single field the following were found: Alternaria tenuis, general on the dead margins of the leaves; Fusarium moniliforme, causing an ear rot, prevalent over the field; Physoderma zeae-maydis, general and severe; Puccinia sorghi, common on the leaves; Ustilago zeae, present in small amount on the ears, not an important factor.

PEA. Fusarium root rot causing some loss. Infection scattered throughout fields. Ventura County, October 22.

SEQUOIA GIGANTEA. Trees upwards of 35 years of age are showing a pronounced and fairly rapid die-back of the twigs and branches. The trees are slowly being killed. From still living but infected twigs a Pestalozzia has been isolated. Los Angeles County, October 14.

SUGAR BEET. Root rot, Corticium vagum: Caused at least a 10 percent loss in a field near Santa Paula, Ventura County. The roots were completely rotted in small circular areas involving 15 or 20 beets, throughout the field.

Alternaria tenuis. A fungus was found growing on the leaves of sugar beet, causing a distinct spot. August 18.

Leaf spot, Cercospora beticola: Abundant on sugar beet leaves near Artesia, Los Angeles County.

Rust, Uromyces betae: Abundant on sugar beet leaves near Artesia, Los Angeles County, October 14.

WHEAT. Stem rust, Puccinia graminis: Prevalent on wheat near Buellton, Santa Barbara County, May 20. (Division of Fruit and Vegetable Crops and Diseases, and University of California at Los Angeles).

DECIDUOUS-SEEDLING DISEASES IN MIDWEST NURSERIES

Ernest Wright

The study of broadleaf-seedling diseases has become increasingly important during the past two years due to the establishment of large Federal deciduous-seedling nurseries. In the Midwest damping-off and root rot are not uncommon. Isolations have been secured from a number of deciduous hosts. The fungus most frequently isolated from diseased seedlings was Rhizoctonia solani Kühn. Since some of the hosts from which R. solani was obtained have apparently not been reported before, a list is herewith submitted covering the isolations made to date. (See also page 82).

Rhizoctonia isolates from deciduous seedlings:

Host	Locality	Character of injury
Silver maple, Acer saccharinum L.	Enid, Okla.	Root rot (damping-off)
Green ash, Fraxinus pennsylvanica Marsh. var. lanceolata (Bockh.) Sary.	Enid, Okla.	Top blight
Catalpa, Catalpa speciosa Warder	Arlington, Nebr.	Root rot (damping-off)
Chinese elm, Ulmus pumila L.	Brookings, S. Dak. Fremont, Nebr. Arlington, Nebr. Manhattan, Kans. Winfield, Kans. Tecumseh, Okla. Chillicothe, Texas. Rayland, Texas.	Root rot (damping-off)
American elm, Ulmus americana L.	Brookings, S. Dak. Manhattan, Kans. Winfield, Kans. Oklahoma City, Okla. Rayland, Texas.	Root rot (damping-off
Desert willow, Chilopsis linearis DC.	Rayland, Texas.	Root rot (damping-off)
Black locust, Robinia pseudoacacia	Lincoln, Nebr. Rayland, Texas.	Root rot (damping-off)
Siberian pea, Caragana arborescens Lam.	Mandan, N. Dak.	Root rot (old seedlings; no damping-off)

Soil inoculation tests so far have shown most of the isolates listed in the tabulation to be definitely pathogenic, though some difference in virulence was noticed between isolates.

Rhizoctonia solani has been reported as causing damping-off of black locust seedlings in Palestine (Rev. Appl. Myc. 8:235. 1929). P. R. Miller stated that R. solani caused severe defoliation of this species in a Tennessee nursery (Plant Disease Reporter 18:139. 1934). Lambert and Crandall also reported damping-off of black locust with which R. solani was associated, in Virginia (Phytopath. 25:24-25. 1935).

Rhizoctonia has been reported isolated from Fraxinus sp. in Italy (Rev. Appl. Myc. 13:597. 1934), while Hartley refers to Rhizoctonia on catalpa (U.S.D.A. Bul. 934, p. 4. 1921).

None of the other species listed in the tabulation were given as hosts for Rhizoctonia solani or Corticium vagum in the following publications: Experiment Station Record, Journal of Agricultural Research, Phytopathology, Review of Applied Mycology, Seymour's Host Index of the Fungi of North America, Check List of Diseases of Economic Plants in the United States, U.S.D.A. Bul. 1366, 1926, and Foreign Plant Diseases, U.S.D.A. Bul. 1926.

Pythium sp. has also been isolated rather frequently from deciduous seedlings, but the specific identity of the fungus has not yet been determined. The deciduous hosts from which Pythium sp. has been obtained are given in the following list:

Pythium sp. isolates from deciduous seedlings:

Host	Locality	Character of injury
American elm, Ulmus americana L.	Arlington, Nebr. Lincoln, Nebr. Baltic, S. Dak. Lincoln, Nebr. Manhattan, Kans.	Root rot (damping-off)
Chinese elm, Ulmus pumila L.	Abilene, Kans. Winfield, Kans. Oklahoma City, Okla. Noble, Okla. Tecumseh, Okla.	Root rot (damping-off)
Catalpa, Catalpa speciosa Warder	Abilene, Kans. Winfield, Kans.	Root rot (damping-off)
Black locust, Robinia pseudoacacia	Lincoln, Nebr. Rayland, Texas.	Root rot (damping off)

(Division of Forest Pathology, Bureau of Plant Industry, in Cooperation with U. S. Forest Service).

RHIZOCTONIA ON TREE SEEDLINGS: In the past three years Rhizoctonia has been isolated by the writer and others from seedlings of the following deciduous species: black locust from North Carolina, Maryland, Virginia, and Alabama; mimosa, North Carolina; hophornbeam, Missouri; tulip poplar, Virginia and Ohio. (Bowen S. Crandall, Division of Forest Pathology).

TEMPERATURE IN 1936

Precipitation for the year 1936 was discussed in the February 1 issue, pages 37 to 39, and Figure 3. The following account and accompanying map (Fig. 9) showing temperature in 1936 is taken from the Weekly Weather and Crop Bulletin for the week ending February 16, 1937.

Conforming to a long series of preceding years, the temperature for 1936 averaged above normal in nearly all sections of the country. Notwithstanding the extremely cold weather in many States during January and February, abnormally high temperatures during the other months of the year brought the annual average to above normal rather generally.

Figure 9 shows that the year was somewhat cooler than normal in the west Gulf section, and also in the Lake region and extreme upper Mississippi Valley. In all other sections of the country the averages were above normal. In the Central States from the Mississippi Valley westward, and also throughout the Pacific coast area, the year was abnormally warm, the average temperature ranging generally from about 1.5° to more than 3° above normal, representing a large departure for a period of 12 months. Also, in a considerable area of the Southeast the annual averages ranged from 1° to more than 2° in excess of normal.

In much of the interior of the country the annual departures were quite similar to those for 1935, but west of the Rocky Mountains, 1936 was the warmer year by a considerable margin.

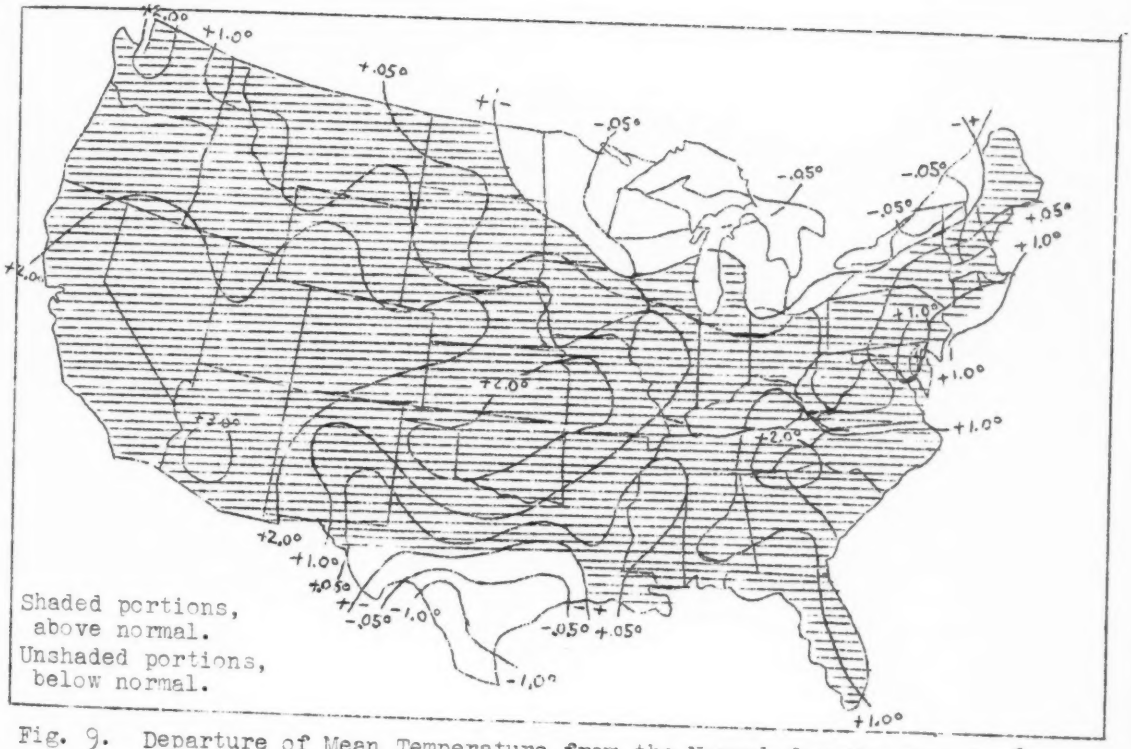

Fig. 9. Departure of Mean Temperature from the Normal for the Year 1936